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Offshore Environmental
Studies Program

OCS Report
MMS 89-0009

Studies Plan Fiscal Year 1990

(Headquarters Office)

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MMS

U.S. Department of the Interior
Minerals Management Service
Branch of Environmental Studies

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Studies Plan Fiscal Year 1990

(Headquarters Office)

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INTRODUCTION

The Environmental Studies Program (ESP) of the Minerals Management Service (MMS) consists of offices at its headquarters in Washington, D.C., and in each MMS region: Atlantic, Gulf of Mexico, Pacific, and Alaska. Each office produces a studies plan describing the studies proposed for funding by that office for each fiscal year. The purpose of these studies is to address the information needs regarding oil and gas exploration, development, and production on the U.S. Outer Continental Shelf (OCS), as identified by MMS staff, other Federal agencies, coastal States, representatives of industry and private agencies, environmental groups, and the public. These studies are designed specifically to provide information for prelease and postlease management decisions. Studies are periodically reviewed for usefulness. The ESP is an ongoing effort that recognizes the need for modification, additions, or deletions of studies previously identified, as new concerns arise or as changes in the leasing schedule are implemented.

The Headquarters Office Studies Plan is produced by the Branch of Environmental Studies in Washington, D.C. In contrast to the studies plans produced by the regional offices, which focus on specific geographic areas, when planning studies, the Headquarters Office Studies Plan emphasizes program quality assurance, information and dissemination, data synthesis, and generic or programmatic studies. These activities are not unique to a particular region; they are of national significance and so are managed at the headquarters level. As in the regional offices, an annual plan is prepared describing the activities proposed for the upcoming fiscal year (FY). This report addresses the Headquarters Office Studies Plan for FY 1990.

Background

The ESP was initiated in 1973 with the award of several contracts for collection and synthesis of environmental and socioeconomic information for the Gulf of Mexico and the Atlantic coast. Similar studies for the other OCS regions were funded in subsequent years. From 1974 through 1977, baseline studies were conducted in each OCS region where industry expressed an interest in leasing. These large-scale, multidisciplinary studies were designed to provide decisionmakers a statistically valid baseline of the geologic, physical, biological, and chemical characteristics of the proposed leasing areas. The baseline concept, however, was abandoned when it was determined that the studies were not providing timely and appropriate information for leasing decisions.

From 1976 to 1978, the National Academy of Sciences (NAS), at the request of the Department of the Interior, reviewed the entire ESP and evaluated the adequacy of the program to meet agency objectives and the relevance of the information collected. In late 1978, the ESP was restructured according to the NAS findings and recommendations. The restructured ESP was oriented towards obtaining more immediately usable results for leasing and management decisions. In addition, a framework for establishing priorities of studies, the National Studies List, was developed as a result of the NAS review. Since 1978, the program has continued to mature. In FY 1986, the MMS asked the NAS to review the ESP again. This review is focusing on the adequacy of data presently available to the ESP and the ESP need for additional data to fulfill its mission. In addition, the General Accounting Office (GAO), which audited the ESP in 1978, completed a new review of the program in early 1988. These results were released on June 29, 1988 (GAO/RCED-88-104).

The OCS Lands Act of 1953 (P.L. 95-372), as amended in 1978, established policy for the management of the OCS Oil and Gas 5-Year Leasing Program and for the protection of marine and

coastal environments. Section 20 of the Act authorizes the ESP and provides three general goals for the program. These goals are:

- (1) to establish information needed for assessment and management of environmental impacts on the human, marine, and coastal environments of the OCS and the potentially affected coastal areas;
- (2) to predict impacts on the marine biota, which may result from chronic low level pollution or large spills associated with OCS production, from muds and cuttings discharges, pipeline emplacement, or onshore support facilities; and
- (3) to monitor human, marine, and coastal environments to provide time series and data trend information for identification of significant changes in the quality and productivity of these environments, and to identify the causes of these changes.

The ESP covers the entire United States OCS and has historically funded an average of \$30 million annually in environmental and socioeconomic studies. Funding in recent years has declined (fig. 1), basically mirroring the maturity of the program.

Studies supported by the ESP are designed to provide information for decisionmakers involved in OCS-related activities. This decisionmaking occurs at both the regional and headquarters levels. Information produced by the ESP is used to prepare Environmental Impact Statements, other Department of the Interior documents, and special issue papers, as required. In addition, ESP data are used to support decisions on exploration and development/production activities. Studies are also made available to the public and other interested agencies to aid in their evaluation of proposed actions relating to oil and gas development on the OCS.

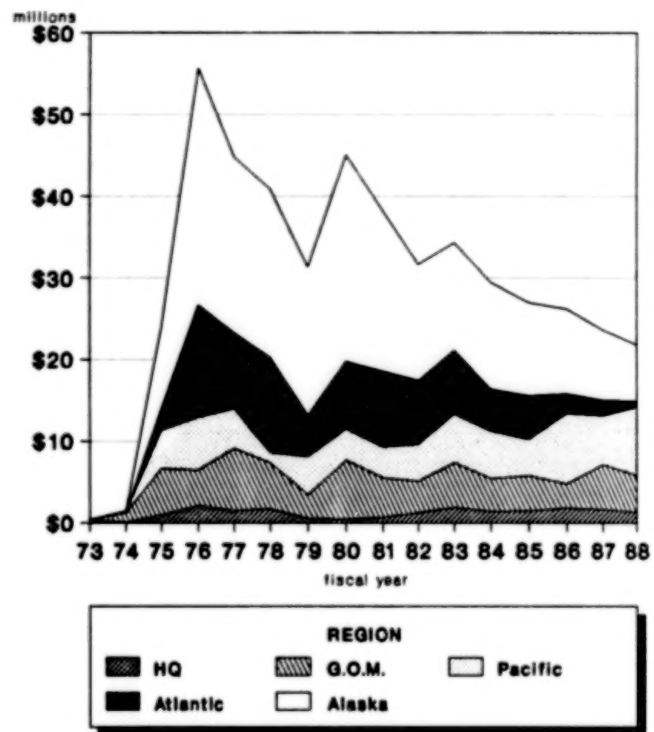


Figure 1 -- Total ESP Spending by Region and Fiscal Year

Headquarters Office

The Branch of Environmental Studies (BES) is located in the Offshore Environmental Assessment Division in MMS headquarters. The BES is responsible for overall management, planning, and budgeting for the ESP and for database design and maintenance, program quality assurance, and design and management of most generic studies. Specifically, the BES provides scientific and technical recommendations to MMS decisionmakers for the formulation of policy for environmental research; assesses technical adequacy in contract development; monitors field office management of contracts; produces the Long Range Studies Plan for the ESP; implements the ESP programmatic guidance ("Studies Design for Research Management Decisions," 1978) and annual memoranda on program priorities; and assures regional office implementation of the regional studies plans developed under this guidance. The BES, with

other headquarters offices, also develops studies that are national in scope, that address issues common to more than one region, or that address the problem of the overall quality of the ESP.

Historically, the headquarters studies program has represented the smallest part of the ESP's total budget (fig. 1). Through FY 1987, headquarters studies have amounted to \$17.7 million, or approximately 4 percent of the ESP's budget (fig. 2).

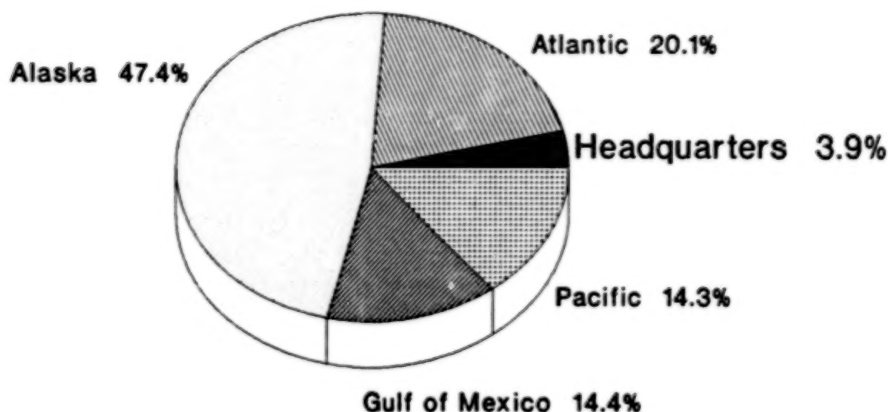


**Figure 2 -- Total ESP Spending by Region,
Fiscal Years 1973-1987**

Headquarters studies, unlike those conducted in the regions, are not generally concerned with collecting and/or analyzing data on a specific region. Headquarters studies generally involve more than one region, summarize or integrate previous studies, or support the overall quality and integrity of the ESP. Studies proposed in the FY 1990 Headquarters Office Studies Plan fall into two categories: administrative or quality control (75 percent in FY 1990) and generic research, which is defined as studies affecting more than one region (25 percent in FY 1990).

Planning Process

Studies nominated for the Headquarters Office Studies Plan begin as information needs identified by the BES staff, the Scientific Committee of the OCS Advisory Board, or other MMS headquarters branches. The BES staff translates these information needs into brief study profiles, which are then used to discuss and rank the study's relative importance to the overall ESP. From these discussions, the BES staff identifies issues that should be handled at the national level and compiles the Headquarters Office Studies Plan. Studies on this plan, along with studies on the regional studies plans, are reviewed and ranked as to both their regional and national importance to produce the National Studies List (NSL). The process begins with the BES compiling a draft NSL, which is reviewed by all regions and the Scientific Committee. A second draft is then prepared by the BES, followed by two joint reviews (headquarters and regions) and by a meeting at headquarters for the Regional Supervisors, the Chief of Offshore Environmental Assessment Division, and the Deputy Associate Director for Offshore Leasing. The NSL is then sent to the Regional Directors for comments. When a consensus is reached, the NSL is sent to the MMS Director for

approval. A decision to fund any individual study on the NSL is determined by the studies ranking and the availability of funds. Multiple-year studies for which the ESP has a contractual obligation to fund are reviewed and evaluated each year, but are not ranked. These studies are funded first if the review shows that they should be continued.

RANKING CRITERIA

Criterion A

Mandate for Conducting Study

1. Information for a study is **essential** for a specific leasing, lease management, or program management decision because the study is:
 - a. Ordered by a court to support a sale or program-specific decision; or
 - b. Explicitly required by existing Federal or State statute or by an Agency directive.
2. The study will provide **critical** information for a specific leasing or lease management decision involving environmental risk or impact or for a specific program management decision, or a similar study is required by previous agreement for settlement of litigation in a similar OCS region.
3. The study will provide **useful** information for a specific leasing or lease management decision involving environmental risk or impact or for a specific program management decision.
4. The study information **will not** affect a leasing or lease management decision involving environmental risk or impact or a specific program management decision. However, it could contribute to improved leasing, lease management, or program management decisions through the enhancement and/or refinement of the quality of the database.

Criterion B

Timing and Content for the Required Information

1. The study **must be initiated** within the budget period at issue:
 - a. In order to be completed in time for use in a specific leasing, lease management, or specific program management decision; or
 - b. Because the study is a necessary prerequisite for another study to support a leasing, lease management, or program management decision; or
 - c. Because the study is a continuation or logical extension or a consequence to an ongoing study to support a leasing, lease management, or program management decision.

2. A study **can be deferred** until the next budget period; however, such a deferral can create a **significant risk** that the study cannot be completed in time for use in immediate leasing, lease management, or program management decisionmaking.
3. A study **can be deferred** until the next budget period and can still be completed **in time** for use in forthcoming leasing, lease management, or program management decisionmaking.

The above cited criteria result in 12 classes of studies in the following priority order:

Class 1 - **A1B1**

Class 5 - **A3B1**

Class 9 - **A3B3**

Class 2 - **A2B1**

Class 6 - **A3B2**

Class 10 - **A4B1**

Class 3 - **A1B2**

Class 7 - **A1B3**

Class 11 - **A4B2**

Class 4 - **A2B2**

Class 8 - **A2B3**

Class 12 - **A4B3**

PROPOSED STUDIES

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National Studies List Number: _____

Title: **Evaluation of the OCS Environmental Studies Program by the National Academy of Sciences**

Priority Ranking: **Contractually Obligated (MMS Contract 30342)**

Region: **Headquarters**

Proposed Period of Performance: **52 months (May 1986 - Sept. 1990)**

Cumulative Project Cost: **\$1,917,957 (through FY 1988)**

Applicable Planning Area(s): **Not Related to any Planning Area**

Key Words: **Program Review, Literature Review, Planning and Program Evaluation**

Description of Proposed Project

Objectives

To provide an independent evaluation of the adequacy and applicability of past MMS/ESP studies, specific recommendations for future studies, and a state-of-the-art overview of available information on each major issue reviewed.

Methods

The program review will be conducted by a steering committee and by topic review panels composed of experts from the scientific community. The review will be based on literature reviews (including MMS reports) in each topic area selected by the steering committee.

Area of Study

All OCS planning areas will be included.

Products

Annotated literature and database reviews and program evaluation reports for each topic will be prepared, as well as an overall executive summary report.

Justification

Importance of the Study to MMS Decisionmakers

The report will provide guidance in planning future studies, including recommendations to discontinue studies in areas where there is sufficient information, in determining transferability of study results among regions and species, and in determining highest priority topics that should be studied.

Date Information Required and Decisions Involved

Information will be useful for all planning and decision steps as it becomes available.

Current Status of Information on This Topic

The last major program review was conducted by the National Academy of Sciences approximately 10 years ago.

Applicability of Information to Issues of Regional or Programmatic Concern

The evaluation reports will apply to all regions.

National Studies List Number: ____

Title: **Estimates of Potential Social Cost of Developing the Oil and Gas Resources in Each OCS Planning Area**

Priority Ranking: **Contractually Obligated (NSL 28 - FY 1989)**

Region: **Headquarters**

Proposed Period of Performance: **3 Years (1989-1991)**

Applicable Planning Area(s): **All Planning Areas**

Key Words: **Potential Social and Regional Cost, Oil-Spill Cost, Non Oil-Spill Cost, Sensitivity Analysis**

Description of Proposed Project

Objectives

The objective of this study is to quantify the possible cost of OCS oil and gas development to aid in developing a lease schedule based on a balance of OCS benefits and costs. More specifically, the objective is to estimate the discounted present value of the cost of OCS oil and gas development for each planning area. Two types of costs are estimated: oil-spill cost and non oil-spill cost.

Methods

The basic approach, used in the current 5-year leasing plan, is to estimate both types of costs by using various types of data as inputs to a social cost model. (For a detailed description of the methodology used, see "5-Year Leasing Program Mid-1987 to Mid-1992," Appendix G, pages G4-G5.) Input data for the oil-spill costs consist of such factors as oil and gas resource estimates; production estimates; oil-spill probabilities and estimates of spill sizes; the probability estimates of oil spills reaching land; and the results of trajectory modeling. Non-spill costs are estimated using cost coefficients based on total OCS activity, as measured by oil and gas production estimates.

Area of Study

All OCS Planning Areas

Products

A narrative report analyzing the social cost of oil spills. This analysis is an important input to the 5-year leasing plan Secretarial Issue Document.

Justification

Importance of the Study to MMS Decisionmakers

Section 18(a)(3) of the OCS Lands Act (OCSLA) requires that the timing and location of individual OCS lease sales be based on a consideration of balancing the potential for environmental damage and the adverse impact on the coastal zone against the value of oil and gas discoveries. This study will present an economic basis for evaluation of possible environmental damage caused by OCS activities associated with the proposed and alternative 5-year leasing plan.

Date Information Required and Decisions Involved

This analysis must be completed in time to be included in the next 5-year leasing plan.

Current Status of Information on This Topic

The social cost analysis for the current 5-year leasing plan, commencing in mid-1987, is completed.

Applicability of Information to Issues of Regional or Programmatic Concern

The social cost analysis is an important component of the Section 18 process.

National Studies List Number: _____

Title: **Marine Productivity and Environmental Sensitivity, Outer Continental Shelf (OCS) Oil and Gas 5-Year Leasing Program, 1992-1997**

Ranking: **Contractually Obligated (NSL 57 - FY 1989)**

Region: **Headquarters**

Proposed Period of Performance: **2 Years (1989-1990)**

Applicable Planning Area(s): **All Planning Areas**

Key Words: **Marine Productivity, Environmental Sensitivity, 5-Year Program**

Description of Proposed Project

Objectives

The objective of this study is to fill data gaps in the field of marine productivity and environmental sensitivities for all areas considered for leasing under the proposed OCS oil and gas 5-year leasing plan for 1992-1997.

Methods

This will be primarily a literature search and synthesis of all available information pertinent to making decisions for the 1992-1997 leasing program.

Area of Study

All OCS Planning Areas

Products

Reports analyzing various methods for measuring marine productivity and environmental sensitivities; reports synthesizing information to fill data gaps concerning issues or questions raised by critics of the 5-year leasing plan.

Justification

Importance of the Study to MMS Decisionmakers

The OCS Lands Act requires an assessment of the marine productivity and environmental sensitivity of OCS planning areas. The BES has made available approximately \$764,000 for studies to develop data for use in preparing the Marine Productivity and Environmental Sensitivity Analysis for the current 5-year leasing plan. Comments about the current analysis contained in the proposed final program for 1987-1992 were received from the Environmental Protection Agency, the National Oceanic and Atmospheric Administration, several private environmental organizations, and several States. This study will seek to respond to these comments.

Date Information Required and Decisions Involved

The results will apply to early planning decisions on the next proposed draft program for 1992-1997. Information from the proposed study could be used as early as FY 1990.

Current Status of Information on This Topic

A study on this topic was completed in the mid-1980's as part of the last 5-Year Program.

Applicability of Information to Issues of Regional or Programmatic Concern

This study will provide information on marine productivity and environmental sensitivity in OCS areas for which current information used in making long-term planning decisions could be updated.

National Studies List Number: _____

Title: **Archiving and Curating Biological Specimens**

Priority Ranking: **Contractually Obligated (MMS Contract 29042 through 1988)**

Region: **Headquarters**

Proposed Period of Performance: **5 Years (1989-1993)**

Cumulative Project Cost: **\$1,396,070 (through FY 1988)**

Applicable Planning Area(s): **Not Related to any Planning Area**

Key Words: **Archive, Curate, Specimens, Biology, Smithsonian, Invertebrates**

Description of Proposed Project

Objectives

The major objective of this project is to archive and curate biological material in accordance with the U.S. National Museum's standards of specimen management.

Methods

The procedures for archiving and curating include inventorying material as it is received, cataloging identified sorted specimens, sorting mixed lots of specimens, sorting new fauna from raw unsorted benthic samples, rebottling specimens as necessary, generating file cards and outer and inner labels for identified lots of specimens using ADP procedures, and initiating and refining screen formats and other ADP-oriented procedures specifically designed for the processing of MMS biological materials.

Area of Study

All OCS planning areas except Alaska. Biological specimens collected in Alaska are archived by the California Academy of Sciences Museum.

Products

Semiannual reports and reliably archived biological specimens.

Justification

Importance of the Study to MMS Decisionmakers

This project provides reliable maintenance of biological material collected through the MMS offshore ESP. Although it is not directed at specific OCS lease management decisions, this project is important for the overall program quality assurance in the area of biological standardization. The MMS biological samples are reliably maintained, taxonomically verified, and made accessible to future researchers.

Date Information Required and Decisions Involved

This project is required in this budget cycle to allow for continuation of reliable maintenance of MMS biological specimens.

Current Status of Information on This Topic

Since October 1979, approximately 77,000 MMS specimen lots have been cataloged in the Smithsonian Institution's Department of Invertebrate Zoology. An additional 211,000 MMS lots have been identified but not yet cataloged, and 28,000 MMS lots remain to be sorted and identified.

Applicability of Information to Issues of Regional or Programmatic Concern

Program quality assurance (biological standardization)

National Studies List Number: ____

Title: **Support for the OCS Advisory Board, Scientific Committee**

Priority Ranking: **A1B1**

Region: **Headquarters**

Proposed Period of Performance: **1 Year**

Applicable Planning Area(s): **Not Related to any Planning Area**

Key Words: **Program Review**

Description of Proposed Project

Objectives

The objective of this project is to provide support to the Scientific Committee.

Methods

Not Applicable

Area of Study

Not Applicable

Products

Not Applicable

Justification

Importance of the Study to MMS Decisionmakers

The Scientific Committee is one of three committees that compose the OCS Advisory Board. Its purpose is to advise the Director, MMS, on the feasibility, appropriateness, and scientific value of the ESP. The Scientific Committee reviews the relevance of the data produced by the ESP and may recommend changes in the program's scope, direction, or emphasis.

Date Information Required and Decisions Involved

Not Applicable

Current Status of Information on This Topic

Not Applicable

Applicability of Information to Issues of Regional or Programmatic Concern

Not Applicable

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National Studies List Number: _____

Title: **Use of Satellite Tracked Drifting Buoys to Simulate the Movement of Spilled Oil**

Priority Ranking: **A2B1**

Region: **Headquarters**

Proposed Period of Performance: **3 years (1990 - 1992)**

Applicable Planning Area(s): **All Planning Areas**

Key Words: **Drifters, Model, Oil-Spill Probabilities, Satellite, Trajectories**

Description of Proposed Project

Objectives

The objective of this study is to assess the MMS Oil-Spill Risk Analysis (OSRA) model and to test the accuracy of the model's oil-spill trajectories.

Methods

A quantity of satellite tracked drifters identified during Phase 1 and field tested during Phase 2 will be purchased. These drifters will be released in those OCS planning areas not covered under Phase 3. After release, the buoys will be tracked for up to 30 days. The drifter trajectories will then be compared, taking into account various statistical factors, with the oil-spill trajectories predicted by the OSRA model.

Area of Study

All OCS Planning Areas

Products

Drifter trajectory charts and analyses; reports analyzing and comparing the obtained drifter trajectories and the OSRA model trajectories.

Justification

Importance of the Study to MMS Decisionmakers

To date, the only assessment of the oil-spill trajectories predicted by the OSRA model has been through hindcasting of historic oil spills. The model has been criticized by various State and environmental groups as not depicting accurately the probable path of spilled oil in certain areas of the OCS. This study continues to provide a means, by way of actual physical measurements, of assessing the oil-spill trajectories predicted by the OSRA model. The results of this analysis may provide information by which the OSRA model can be refined and improved.

Date Information Required and Decisions Involved

The results are applicable to presale and postsale decisions after mid- FY 1990.

Current Status of Information on This Topic

Previous drifter analyses on the OCS have been concerned with only the depiction of the surface water movement, not with the simulation of the movement of oil on the surface. Spilled oil reacts differently than does surface water to various physical factors (wind, currents, etc.) and may follow a completely different path. Other than the hindcasting technique mentioned previously, no assessment of the OSRA model has been conducted.

Applicability of Information to Issues of Regional or Programmatic Concern

This study will provide information regarding circulation features in areas of the OCS where extensive field physical oceanography programs have not been conducted.

National Studies List Number: _____

Title: **Chemical Quality Assurance**

Priority Ranking: **A2B1 (NOAA/OCSEAP IA - RU-557)**

Region: **Headquarters**

Proposed Period of Performance: **1 Year**

Cumulative Project Cost: **\$1,798,297 through 1988**

Applicable Planning Area(s): **All Planning Areas**

Key Words: **Petroleum Hydrocarbons, Polycyclic Aromatic Hydrocarbons, Intercalibration, Interim Reference Material (IRM)**

Description of Proposed Project

Objectives

The objective of this study is to coordinate and conduct an analytical quality assurance program that permits a meaningful comparison of results among investigators within the Outer Continental Shelf Environmental Assessment Program (OCSEAP), as well as between OCSEAP and other MMS-funded investigators.

Methods

This program uses the National Oceanographic and Atmospheric Administration's (NOAA) National Analytical Facility (NAF), which conducts interlaboratory comparison exercises among qualified analytical laboratories associated with NOAA and MMS programs. Interim Reference Materials (IRM's) have been prepared from harbor sediments (Duwamish I and II and Sinclair I) known to be contaminated with hydrocarbons, and IRM's have been distributed in multiple portions to laboratories participating in interlaboratory comparison exercises. Analytical results are then returned to the NAF for evaluation by chemists and statisticians.

Area of Study

All OCS Planning Areas

Products

Reports will describe the parameters measured, number of samples analyzed, methodology employed, improvements of or recommendations on methodology, and results from intercalibration exercises with statistical evaluation of the data.

Justification

Importance of the Study to MMS Decisionmakers

This information is necessary for maintaining the ability to compare hydrocarbon measurements from different studies and thus verify the reliability of data used in impact analyses.

Date Information Required and Decisions Involved

Not Applicable

Current Status of Information on This Topic

Quality assurance activities must be continuous to support ongoing analytical efforts in all MMS studies. The ESP has supported this project since 1978.

Applicability of Information to Issues of Regional or Programmatic Concern

Quality assurance is important for determining the reliability of measurements and for producing meaningful comparisons of data from several projects and/or regions. Data can be exchanged only if the quality is known and if the data are comparable and reliable enough to satisfy the needs of the secondary user.

National Studies List Number: _____

Title: **Program Quality Assurance**

Priority Ranking: **A2B1**

Region: **Headquarters**

Proposed Period of Performance: **1 Year**

Applicable Planning Area(s): **Not Related to any Planning Area**

Key Words: **Program Quality**

Description of Proposed Project

Objectives

Program Quality Assurance is not actually a study. However, it is used to fund studies identified during the year, additional tasks for current studies, cost overruns, conferences, workshops, and symposia, as well as other activities that will improve the quality of the ESP. Approximately 2 percent of the annual budget is allocated to this effort.

Methods

Not Applicable

Area of Study

Not Applicable

Products

Not Applicable

Justification

Importance of the Study to MMS Decisionmakers

This program allows for the flexibility necessary to respond to unexpected events and ensures that modest cost increases and new opportunities can be accommodated without disrupting planned procurement efforts.

Date Information Required and Decisions Involved

Not Applicable

Current Status of Information on This Topic

Not Applicable

Applicability of Information to Issues of Regional or Programmatic Concern

Not Applicable

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to assure that their development is in the best interest of all our people. The Department also has a major responsibility for American Indian reservation communities and for people who live in Island Territories under U.S. Administration.



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